EVENING SCHOOL BULLETIN

ASHEVILLE-BUNCOMBE TECHNICAL INSTITUTE

This bulletin should not be considered a contract between Asheville-Buncombe Technical Institute and any prospective student. All charges for tuition and fees are subject to change as required by the Board of Trustees. Also curriculum offerings may be altered to meet the needs of individual departments.

ASHEVILLE-BUNCOMBE TECHNICAL INSTITUTE

340 Victoria Road
Asheville, N. C.

Recognized and Approved By
North Carolina State Board of Education
North Carolina Department of Community Colleges
Division of Vocational Rehabilitation
Veterans Administration

Member of
American Association of Junior Colleges
North Carolina Department of Community Colleges
Student Services Personnel Association
Association of Occupational Curriculum Directors

Accredited By
Southern Association of Colleges and Schools

EVENING BULLETIN

VOLUME I

EVENING SCHOOL CALENDAR
1970 — 1971

FALL QUARTER 1970

Registration	September 8
Classes Begin	September 8
Classes End	November 19

(Snow days may be made up here)
Total Days — 43
Holidays — Nov. 20 through Nov. 29

WINTER QUARTER 1970-'71

Registration	November 30
Classes Begin	November 30
Classes End	February 25

(Snow days may be made up here)
Total Days — 44
Holidays — Christmas, Dec. 18 through Jan. 3

SPRING QUARTER 1971

Registration	March 15
Classes Begin	March 15
Classes End	May 27

Total Days — 43
Holidays — Easter, April 12 (Monday)

SUMMER QUARTER 1971

Registration	June 7
Classes Begin	June 7
Classes End	August 19

Total Days — 43
Holidays — July 5 (Monday)
Graduation — August 27

FALL QUARTER 1971-'72

Registration	(Probably) September 7
Classes Begin	(Probably) September 7

1970

SEPTEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

DECEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

1971

JANUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

APRIL

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

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ADMINISTRATION

Thomas W. Simpson	President
Brewster C. Adams	Dean of Evening Programs
Mrs. Frances Johnson	Registrar
Miss Martha Elizabeth English	Associate Librarian
Mrs. Carolyn Shotwell	Secretary for the Evening Programs

FACULTY

Part-time evening instructors are employed on the basis of their knowledge of the specific subject they are to teach. Some may be trained teachers, while some may be selected because of the technical knowledge they have acquired through work in industry and/or training.

The State Board of Education policy permits some full-time day instructors to be employed to teach in the evening on a part-time basis depending on the need. Part-time personnel may change from quarter to quarter to allow for the necessary flexibility in scheduling courses.

CURRICULAR EDUCATION

This bulletin is intended as a supplement to the regular catalog. Curricular outlines are the same as for the day program except that course sequence and length of study may vary. Students may register for one or several courses during any quarter. Pre-requisites will be adhered to at all times.

NON-CURRICULAR EDUCATION

1. Adult basic education provides training in primary and elementary education from pre-literacy through Grade 8.

2 Extension education includes training in various areas of trade, industrial, business, and service occupations to upgrade and retrain workers. This may also include short-term pre-employment training for potential employees of new and expanding industries, and training in the skills of occupational

classifications under provisions of the Manpower Development and Training Act.

3. General adult education provides continuation of adult basic education at the secondary level, including preparation for the high school equivalency examination. In addition, courses are offered that are designed to promote the avocational, personal improvement, and cultural interests of the adult population.

4. The learning laboratory provides opportunity for self-study, under supervision, for the purpose of correcting deficiencies in educational backgrounds of persons enrolled or preparing to enroll in the curriculum areas. The lab also provides opportunity for the general public to further develop individual vocational and academic interests in an unscheduled situation.

ADMISSION PROCEDURE AND STUDENT INFORMATION

GENERAL ENTRANCE REQUIREMENTS

Asheville-Buncombe Technical Institute operates an "Open Door" admission policy. Any applicant who has completed high school, or who is eighteen years of age or older and has completed at least eight units of high school, may be admitted to the Institute.

Placement into a specific course of study is based upon standards which will help to assure the applicant's success in that course of study. Those who do not yet possess the background required by the course of study of his choice may be enrolled in preparatory courses designed to provide this background.

Applicants should be in good health with no impairment of vision or other physical defect which would restrict his ability in a particular field of work. A complete physical examination may be required.

Educational background, interest, motivation, experience and aptitudes will be considered when an application is submitted to the Institute.

ADMISSION PROCEDURE

Persons wishing to enroll at the Institute must complete the entire application process. This consists of the following steps:

1. Submit an application form.
2. Obtain a transcript of credits from the last school attended.
3. Complete the battery of admission and placement tests administered by the Institute.
4. Have a personal interview with the student services staff or other member of the administrative staff.

Upon receipt of the completed application form the Institute will schedule a date for the test administration and notify the applicant by mail. Transcripts should be mailed from the school directly to the Institute on the transcript form in use by that school.

TRANSFER CREDIT

The Asheville-Buncombe Technical Institute will accept and give credit for work completed in other Technical Institutes, or Colleges. Applicants for admission with advanced standing should make application as a regular applicant and submit a transcript of work from prior schools. No credit will be permitted for work below a "C" or the average grade given by another school. Acceptance of such work will be at the discretion of the President.

CREDIT BY EXAMINATION

Applicants who have reason to believe they are proficient in a subject may request credit by examination. Such examination may be written, oral, performance, or all of these. Decision of the examining instructor will be final.

No quality points will be awarded for such credit.

FEES

Advanced Tuition Deposit (paid when application is approved) Credited Toward 1st quarter tuition upon registration of Student – Night Students	$10.00

Tuition:	
Part-time students (less than 13 credit hours), per credit hour, per quarter	$ 2.50
Student year book fee, per quarter	$ 1.75
Late registration fee	$ 5.00

In addition to fees above, students must purchase required textbooks for each course.

Graduation Fees: –	Degree	$12.00
	Diploma	$10.00

STUDENT INSURANCE

Certain risks are inherent in any work involving regular contact with mechanical and electrical equipment. While stringent precautions will be taken to insure safety, it is felt to be in the interest of all students to provide some measure of insurance protection.

A group policy, providing the desired insurance protection will be maintained in effect by the Institute and all students will be REQUIRED to subscribe to such coverage. The cost of accident insurance to the student will be approximately $2.75 per year.

BUSINESS ADMINISTRATION
(General Option)
A.A.S. Degree Conferred

FIRST QUARTER

			C	L	CR.
BUS	101	Introduction to Business	3	2	4
MAT	110	Business Mathematics	5		5
			8	2	9

SECOND QUARTER

MAT	111	Business Mathematics	3		3
ENG	100	Reading Comprehension	3	2	4
ECO	102	Economics	3		3
			9	2	10

THIRD QUARTER

ECO	104	Economics	3		3
PSY	206	Psychology	3		3
BUS	110	Business Machines	1	4	3
			7	4	9

FOURTH QUARTER

BUS	233	Personnel Management and Supervision	5		5
EDP	100	Introduction to Data Processing	3	2	4
			8	2	9

FIFTH QUARTER

BUS	123	Finance	5		5
BUS	247	Insurance	5		5
			10		10

SIXTH QUARTER

BUS	124	Finance	3	2	4
BUS	219	Credit	5		5
			8	2	9

SEVENTH QUARTER

BUS	270	Methods for Managerial Decisions	3	2	4
BUS	239	Introduction to Marketing	5		5
			8	2	9

EIGHTH QUARTER

ECO	106	Labor Economics	3		3
BUS	235	Business Organization and Management	3	2	4
ENG	101	Grammar	3		3
			9	2	10

NINTH QUARTER

BUS	120	Accounting	5	2	6
MAT	112	Math of Business Finance	3	2	4
			8	4	10

TENTH QUARTER

BUS	121	Accounting	5	2	6
ENG	102	Composition	3		3
BUS	115	Business Law	3		3
			11	2	12

ELEVENTH QUARTER

BUS	229	Taxes	3	2	4
ENG	206	Business Communications	3		3
BUS	116	Business Law	3		3
			9	2	10

TWELFTH QUARTER

ENG	204	Oral Communications	3		3
ENG	103	Report Writing	3		3
SOC	201	Social Science	3		3
			9		9

BUSINESS ADMINISTRATION
(Industrial Management Option)
A.A.S. Degree

FIRST QUARTER

			C	L	CR.
BUS	101	Introduction to Business	3	2	4
MAT	110	Business Math	5		5
			8	2	9

SECOND QUARTER

MAT	111	Business Math	3		3
ENG	100	Reading Comprehension	3	2	4
ECO	102	Economics	3		3
			9	2	10

THIRD QUARTER

DFT	101	Drafting I		6	3
ECO	104	Economics	3		3
PSY	206	Applied Psychology	3		3
			6	6	9

FOURTH QUARTER

BUS	233	Personnel Management and Supervision	5		5
BUS	110	Business Machines	1	4	3
			6	4	8

FIFTH QUARTER

MAT	114	Basic Descriptive Statistics	3	2	4
ISC	102	Industrial Safety	3		3
ISC	220	Integrated Management Problems	3		3
			9	2	10

SIXTH QUARTER

ISC	202	Quality Control	3	2	4
ISC	209	Plant Layout	3	2	4
			6	4	8

SEVENTH QUARTER

ISC	203	Time and Motion Study	3	2	4
SOC	201	Social Science	3		3
ISC	204	Value Analysis	3		3
			9	2	10

EIGHTH QUARTER

ISC	211	Work Measurement	3	2	4
EDP	100	Introduction to Data Processing	3	2	4
			6	4	8

NINTH QUARTER

BUS	120	Accounting	5	2	6
BUS	235	Business Organization and Management	3	2	4
			8	4	10

TENTH QUARTER

BUS	225	Cost Accounting	5		5
ENG	101	Grammar	3		3
BUS	115	Business Law	3		3
			11		11

ELEVENTH QUARTER

BUS	116	Business Law	3		3
ENG	102	Composition	3		3
ISC	251	Labor Problems and Labor Law	3	2	4
			9	2	10

TWELFTH QUARTER

BUS	239	Introduction to Marketing	5		5
ENG	206	Business Communications	3		3
ENG	204	Oral Communications	3		3
			11		11

BUSINESS DATA PROCESSING
A.A.S. Degree

FIRST QUARTER

			C	L	CR.
EDP	101	Functional Wiring Principles	2	3	3
EDP	102.1	Introduction to Computer Technology	2		2
MAT	100	Basic Mathematics	5		5
			9	3	10

SECOND QUARTER

EDP	102.2	Introduction to Computer Technology		3	1
EDP	104	Business Programming I (SPS)	2	3	3
MAT	101	Technical Mathematics I	5		5
			7	6	9

THIRD QUARTER

EDP	105	Introduction to Scientific Programming (Fortran)	2	3	3
EDP	107.1	Introduction to System/360 (DOS)	3		3
MAT	102	Technical Mathematics II	5		5
			10	3	11

FOURTH QUARTER

EDP	107.2	Introduction to System/360 (DOS)		2	1
EDP	108	Business Programming II (BAL)	3	2	4
BUS	110	Office Machines	1	4	3
			4	8	8

FIFTH QUARTER

EDP	110	Business Programming III (Cobol)	3	2	4
EDP	111.1	Systems and Procedures (Cobol)	2		2
MAT	104	Mathematics of Finance	5		5
			10	2	11

SIXTH QUARTER

EDP	111.2	Systems and Procedures (Cobol)		3	1
EDP	201	Business Programming IV (RPG)	2	3	3
MAT	214	Statistics	5		5
			7	6	9

SEVENTH QUARTER

EDP	202	Systems and Procedures (RPG)	2	3	3
EDP	205.1	Scientific Programming (Fortran IV)	3		3
ENG	100	Reading Comprehension	3	2	4
			8	5	10

EIGHTH QUARTER

EDP	205.2	Scientific Programming (Fortran)		2	1
EDP	206	Systems and Procedures (Fortran IV)	2	3	3
BUS	101	Introduction to Business	3	2	4
			5	7	8

NINTH QUARTER

EDP	210	Business Programming V (Advanced Cobol)	2	3	3
EDP	211.1	Systems and Procedures (Cobol)	2		2
BUS	120	Accounting I	5	2	6
			9	5	11

TENTH QUARTER

EDP	211.2	Systems and Procedures (Cobol)		3	1
EDP	213	Business Programming VI (PL-1)	3	2	4
BUS	121	Accounting II	5	2	6
			8	7	11

ELEVENTH QUARTER

EDP	215	System/3 and RPG II	3	2	4
ENG	101	Grammar	3		3
ECO	102	Economics	3		3
			9	2	10

TWELFTH QUARTER

BUS	235	Cost Accounting	5		5
PSY	206	Psychology	3		3
ENG	102	Composition	3		3
			11		11

THIRTEENTH QUARTER

SOC	201	Social Science	3		3
ENG	103	Report Writing	3		3
ENG	204	Oral Communications	3		3
BUS	115	Business Law	3		3
			12		12

DRAFTING AND DESIGN TECHNOLOGY
A.A.S. Degree

FIRST QUARTER

			C	L	CR.
DFT	101	Drafting		6	2
MAT	100	Mathematics	5		5
			5	6	7

SECOND QUARTER

DFT	102	Drafting		6	2
MAT	101	Mathematics	5		5
			5	6	7

THIRD QUARTER

DFT	103	Drafting		6	2
MAT	102	Mathematics	5		5
			5	6	7

FOURTH QUARTER

DFT	204	Descriptive Geometric Design	2	6	4
PHY	101	Physics: Properties of Matter	3	2	4
			5	8	8

FIFTH QUARTER

DFT	201	Design Drafting I	2	6	4
PHY	102	Physics: Mechanics	3	2	4
			5	8	8

SIXTH QUARTER

DFT	205	Design Drafting II	2	6	4
ENG	101	Grammar	3		3
PSY	206	Applied Psychology	3		3
			8	6	10

SEVENTH QUARTER

MEC	210	Physical Metallurgy	3	3	4
ENG	102	Composition	3		3
MEC	101.1	Machine Processes		3	1
			6	6	8

EIGHTH QUARTER

MEC	106	Applied Mechanics	5		5
MEC	101.2	Machine Processes		3	1
SOC	201	Social Science	3		3
			8	3	9

NINTH QUARTER

BUS	101	Introduction to Business	3	2	4
MEC	102.1	Machine Processes		3	1
ENG	204	Oral Communication	3		3
			6	5	8

TENTH QUARTER

DFT	211	Mechanisms and Kinematics Design	2	6	4
MEC	102.2	Machine Processes		3	1
Elective			3		3
			5	9	8

ELEVENTH QUARTER

MEC	205	Strength of Materials	3	2	4
PHY	103	Physics: Electricity	3	2	4
			6	4	8

TWELFTH QUARTER

DFT	212	Jig and Fixture Design	2	6	4
MEC	235	Hydraulics and Pneumatics	3	3	4
			5	9	8

THIRTEENTH QUARTER

DFT	206	Design Drafting III	2	6	4
MEC	214	Tool Engineering	3		3
ENG	103	Report Writing	3		3
			8	6	10

ELECTRONICS TECHNOLOGY
A.A.S. Degree

FIRST QUARTER

			C	L	CR.
ELN	101.1	Fundamentals of D.C.	2	6	4
MAT	100	Mathematics	5		5
			7	6	9

SECOND QUARTER

ELN	101.2	Fundamentals of D.C.	2		2
ELN	102.1	Fundamentals of A.C.	3	3	4
MAT	101	Mathematics	5		5
			10	3	11

THIRD QUARTER

ELN	102.2	Fundamentals of A.C.	1	3	2
ELN	105.1	Vacuum Tubes, Theory and Application	1	3	2
MAT	102	Mathematics	5		5
			7	6	9

FOURTH QUARTER

ELN	105.2	Vacuum Tubes, Theory and Application	3	3	4
MAT	103	Mathematics	5		5
			8	3	9

FIFTH QUARTER

ELN	205.1	Introduction to Solid State Devices	4	3	5
MAT	201	Mathematics	5		5
			9	3	10

SIXTH QUARTER

ELN	205.2	Introduction to Solid State Devices		3	1
ELN	233	Instrumentation I	3	2	4
PHY	101	Physics: Properties of Matter	3	2	4
			6	7	9

SEVENTH QUARTER

ELN	206	Network Analysis	3	2	4
ELN	234.1	Instrumentation II	3		3
PHY	102	Physics: Mechanics	3	2	4
			9	4	11

EIGHTH QUARTER

ELN	234.2	Instrumentation II		2	1
ELN	210.1	Semiconductor Circuit Analysis	3	3	4
PHY	104	Physics: Light and Sound	3	2	4
			6	7	9

NINTH QUARTER

ELN	210.2	Semiconductor Circuit Analysis		3	1
ELN	214.1	Waveshaping and Pulse Circuits I	3	2	4
PHY	201	Modern Physics	3	2	4
			6	7	9

TENTH QUARTER

ELN	214.2	Waveshaping and Pulse Circuits I	1	2	2
ELN	216	Circuits and Fields	3	2	4
MAT	121	Numbering Systems-Boolean Algebra	3		3
SOC	201	Social Science	3		3
			10	4	12

ELEVENTH QUARTER

ELN	221	Electronic Circuit Design	1	6	4
ELN	226.1	Microelectronics	1		1
ENG	101	Grammar	3		3
PSY	206	Psychology	3		3
			8	6	11

TWELFTH QUARTER

ELN	226.2	Microelectronics	2	2	3
DFT	101	Technical Drafting		6	2
ENG	102	Composition	3		3
			5	8	8

THIRTEENTH QUARTER

ELN	215	Waveshaping and Pulse Circuits II	4	4	6
ENG	103	Report Writing	3		3
ENG	204	Oral Communication	3		3
			10	4	12

FOURTEENTH QUARTER

ELN	235	Industrial Instrumentation	3	2	4
EDP	100	Introduction to Data Processing	3	2	4
			6	4	8

MECHANICAL ENGINEERING TECHNOLOGY
A.A.S. Degree

FIRST QUARTER

			C	L	CR.
DFT	101	Technical Drafting		6	2
MAT	100	Mathematics	5		5
			5	6	7

SECOND QUARTER

DFT	102	Technical Drafting		6	2
MAT	101	Mathematics	5		5
			5	6	7

THIRD QUARTER

MEC	111	Manufacturing Processes	3	3	4
MAT	102	Mathematics	5		5
			8	3	9

FOURTH QUARTER

MEC	112	Manufacturing Processes	3	3	4
MAT	103	Mathematics	5		5
			8	3	9

FIFTH QUARTER

MEC	212	Practical Automation	3	2	4
PHY	101	Physics: Properties of Matter	3	2	4
			6	4	8

SIXTH QUARTER

MEC	210	Physical Metallurgy	3	3	4
PHY	102	Physics: Mechanics	3	2	4
			6	5	8

SEVENTH QUARTER

MEC	105	Statics	5		5
PHY	103	Physics: Electricity	3	2	4
			8	2	9

EIGHTH QUARTER

MEC	205	Strength of Materials	3	2	4
CHM	101	General Chemistry	2	3	4
			5	5	8

NINTH QUARTER

MEC	235	Hydraulics and Pneumatics	3	3	4
MEC	208	Machine Design	3	3	4
			6	6	8

TENTH QUARTER

ELC	205	Applied Electricity	2	4	4
ENG	101	Grammar	3		3
MEC	206	Dynamics	3		3
			8	4	10

ELEVENTH QUARTER

MEC	209	Machine Design	3	3	4
SOC	201	Social Science	3		3
ENG	102	Composition	3		3
			9	3	10

TWELFTH QUARTER

MEC	220	Power Systems	3		3
PSY	206	Applied Psychology	3		3
ECO	105	Economics	5		5
			11		11

THIRTEENTH QUARTER

ISC	201	Industrial Organization and Management	3		3
ENG	103	Report Writing	3		3
ENG	204	Oral Communication	3		3
			9		9

FOURTEENTH QUARTER

EDP	100	Introduction to Data Processing	3	2	4
ISC	102	Industrial Safety	3		3
			6	2	7

AIR CONDITIONING AND REFRIGERATION

State Diploma Awarded

FIRST QUARTER

			C	L	CR.
AHR	1121.1	Fundamentals of Refrigeration	3	4	4
MAT	1101.1	Fundamentals of Mathematics	4		4
ELC	1117	Basic Electricity	3		3
			10	4	11

SECOND QUARTER

			C	L	CR.
AHR	1121.2	Fundamentals of Refrigeration		7	3
MAT	1101.2	Fundamentals of Mathematics	1		1
MAT	1103	Geometry	3		3
ELC	1118	Applied Electricity	2	3	3
			6	10	10

THIRD QUARTER

			C	L	CR.
AHR	1122.1	Fundamentals of Refrigeration: Commercial	3	4½	4
BPR	1104	Blueprint Reading: Mechanical		3	1
ENG	1101	Reading Improvement	2		2
			5	7½	7

FOURTH QUARTER

			C	L	CR.
AHR	1122.2	Fundamentals of Refrigeration: Commercial		7½	3
WLD	1101	Basic Welding and Cutting		3	1
ENG	1102	Communication Skills	3		3
			3	10½	7

FIFTH QUARTER

			C	L	CR.
AHR	1123.1	Principles of Air Conditioning	3	4½	4
BPR	1116	Blueprint Reading: Air Conditioning	1	3	2
PSY	1101	Human Relations	3		3
			7	7½	9

SIXTH QUARTER

			C	L	CR.
AHR	1123.2	Principles of Air Conditioning		5½	3
AHR	1124.1	Principles of Heating: Fuels and Burners	2		2
PHY	1101	Applied Science	3	2	4
			5	7½	9

SEVENTH QUARTER

AHR	1124.2	Principles of Heating: Fuels and Burners	1	6	3
BUS	1103	Small Business Operations	3		3
AHR	1126.1	All Year Comfort Systems and A.C. Servicing	1	3	2
			5	9	8

EIGHTH QUARTER

AHR	1126.2	All Year Comfort Systems and A.C. Servicing	2	3	3
AHR	1127	Duct Construction and Maintenance	3	6	5
			5	9	8

AUTOMOTIVE MECHANICS
State Diploma

FIRST QUARTER

			C	L	CR.
AUT	1101.1	Internal Combustion Engines	2	5½	4
MAT	1101	Fundamentals of Mathematics	5		5
			7	5½	9

SECOND QUARTER

AUT	1101.2	Internal Combustion Engines	1	6½	3
ENG	1101	Reading Improvement	2		2
BPR	1101	Blueprint Reading: Power Machanics		3	1
			3	9½	6

THIRD QUARTER

AUT	1102.1	Engine Electrical and Fuel Systems	3	5½	5
PHY	1101.1	Applied Science	2	2	3
ENG	1102	Communication Skills	3		3
			8	7½	11

FOURTH QUARTER

AUT	1102.2	Engine Electrical and Fuel Systems	1	7½	3
PHY	1101.2	Applied Science	1		1
PHY	1102	Applied Science	3	2	4
			5	9½	8

FIFTH QUARTER

AUT	1123.1	Automotive Chassis and Suspension System	3	5	5
PSY	1101	Human Relations	3		3
WLD	1101	Basic Gas Welding		3	1
			6	8	9

SIXTH QUARTER

AUT	1123.2	Automotive Chassis and Suspension System		4	1
AUT	1121	Braking Systems	3	3	3
BUS	1103	Small Business Operations	3		3
			6	7	7

SEVENTH QUARTER

AUT	1124	Automotive Power Train Systems	3	9	6
			3	9	6

EIGHTH QUARTER

AUT	1125	Automotive Servicing	3	9	6
			3	9	6

CARPENTRY
State Diploma

FIRST QUARTER			C	L	CR.
CAB	1101.1	Cabinetmaking I	3	5½	5
MAT	1101.1	Fundamentals of Mathematics	4		4
ENG	1101	Reading Improvement	2		2
			9	5½	11
SECOND QUARTER					
CAB	1101.2	Cabinetmaking II	2	6½	4
MAT	1101.2	Fundamentals of Mathematics	1		1
MAT	1103	Geometry	3		3
BPR	1107	Blueprint Reading for Construction Trades		3	1
			6	9½	10
THIRD QUARTER					
CAB	1102	Cabinetmaking II	3	6	5
BPR	1109	Blueprint Reading for Construction Trades		3	1
BUS	1103	Small Business Operations	3		3
			6	9	9
FOURTH QUARTER					
CAB	1103	Cabinetmaking III	3	5	4
CAB	1104	Cabinetmaking IV	2	6	4
			5	11	8
FIFTH QUARTER					
CAR	1104	Materials and Finishes	2	3	3
MAT	1104	Trigonometry	3		3
ENG	1102	Communication Skills	3		3
			8	3	9
SIXTH QUARTER					
CAR	1101	Carpentry I	2	6	4
PSY	1101	Human Relations	3		3
			5	6	7
SEVENTH QUARTER					
CAR	1103	Carpentry II	2	5	3
DFT	1127	General Drafting	2	3	4
			4	8	7
EIGHTH QUARTER					
CAR	1105	Carpentry III	3	11	7
			3	11	7

MACHINE SHOP
State Diploma

FIRST QUARTER

			C	L	CR.
MEC	1101.1	Machine Shop	2	5½	4
MAT	1101.1	Fundamentals of Mathematics	4		4
ENG	1101	Reading Improvement	2		2
			8	5½	10

SECOND QUARTER

MEC	1101.2	Machine Shop	1	6½	3
MAT	1101.2	Fundamentals of Mathematics	1		1
MAT	1103	Geometry	3		3
BPR	1104	Blueprint Reading: Mechanical		3	1
			5	9½	8

THIRD QUARTER

MEC	1102.1	Machine Shop	2	5½	4
MAT	1104	Trigonometry	3		3
BPR	1105	Blueprint Reading: Mechanical		3	1
			5	8½	8

FOURTH QUARTER

MEC	1102.2	Machine Shop	1	6½	3
BPR	1106	Blueprint Reading: Mechanical		3	1
PSY	1101	Human Relations	3		3
			4	9½	7

FIFTH QUARTER

MEC	1103.1	Machine Shop	2	5½	4
PHY	1101	Applied Science	3	2	4
ENG	1102	Communications Skills	3		3
			8	7½	11

SIXTH QUARTER

MEC	1103.2	Machine Shop	1	6½	3
PHY	1102	Applied Science	3	2	4
MEC	1115	Treatment of Ferrous Metals	1	3	2
			5	11½	9

SEVENTH QUARTER

MEC	1104.1	Machine Shop	4	4	5
MEC	1116	Treatment of Non Ferrous Metals	1	3	2
WLD	1101	Basic Gas Welding		3	1
			5	10	8

EIGHTH QUARTER

MEC	1104.2	Machine Shop	1	7	4
MAT	1123	Machinist Mathematics	3		3
BUS	1105	Industrial Organizations	3		3
			7	7	10

TOOL AND DIE MAKING
State Diploma

			C	L	CR.
FIRST QUARTER					
MEC	1201.1	Machine Processes	2	5½	4
MAT	1203	Trigonometry	5		5
			7	5½	9
SECOND QUARTER					
MEC	1201.1	Machine Processes	1	6½	3
MAT	1204	Compound Angles	5		5
			6	6½	8
THIRD QUARTER					
MEC	1202.1	Machine Processes	2	5½	4
DFT	1207	General Machine Drafting		6	2
			2	11½	6
FOURTH QUARTER					
MEC	1202.2	Machine Processes	1	6½	3
ELC	1201	Elecricity – Industrial	2	3	3
BPR	1208	Blueprint Reading: Tool & Die	2	3	3
			5	12½	9
FIFTH QUARTER					
MEC	1204.1	Machine Processes	2	5½	4
MEC	1205	Strength of Materials	5		5
			7	5½	9
SIXTH QUARTER					
MEC	1204.2	Machine Processes	1	6½	3
MEC	1203	Metallurgy	3		3
MEC	1209	Hydraulics and Pneumatics	3		3
			7	6½	9
SEVENTH QUARTER					
MEC	1206.1	Machine Processes	2	5½	4
MEC	1207	Special Problems and Molding	3	4	5
			5	9½	9
EIGHTH QUARTER					
MEC	1206.2	Machine Processes	1	6½	3
MEC	1212	Tool Design Planning	2	3	3
			3	9½	6

WELDING
State Diploma

			C	L	CR.
FIRST QUARTER					
WLD	1120	Oxyacetylene Welding and Cutting	3	12	7
			3	12	7
SECOND QUARTER					
WLD	1121	Arc Welding	3	12	7
			3	12	7
THIRD QUARTER					
WLD	1123	Inert Gas Welding	1	3	2
WLD	1122	Commercial and Industrial Practices	3	9	6
			4	12	8
FOURTH QUARTER					
WLD	1112	Mechanical Testing and Inspection	1	3	2
WLD	1124.1	Pipe Welding	2	5½	4
MEC	1124	Metallurgy	2	1	3
			5	9½	9
FIFTH QUARTER					
WLD	1124.2	Pipe Welding	1	6½	3
WLD	1125	Certification Practices	3	6	5
			4	12½	8
SIXTH QUARTER					
BPR	1104	Blueprint Reading: Mechanical		3	1
ENG	1101	Reading Improvement	2		2
MAT	1101.1	Fundamentals of Mathematics	4		4
PSY	1101	Human Relations	3		3
			9	3	10
SEVENTH QUARTER					
BPR	1117	Blueprint Reading: Welding		3	1
ENG	1102	Communications Skills	3		3
MAT	1101.2	Fundamentals of Mathematics	1		1
MAT	1103	Geometry	3		3
BUS	1105	Industrial Organizations	3		3
			10	3	13
EIGHTH QUARTER					
DFT	1126	Pattern Development and Sketching for Welding		3	1
MEC	1112	Machine Shop Processes		5	2
ELC	1118	Applied Electricity	3	2	4
			3	10	7

Course Descriptions

TECHNICAL EDUCATION

BUS-101 Introduction To Business **(3 - 2 - 4)**

A survey of the business world with particular attention devoted to the structure of the various types of business organizations, methods of financing, internal organization, and management. Prerequisite: None.

BUS-110 Business Machines **(1 - 4 - 3)**

A general survey of the business and office machines Students will receive training in techniques, processes, operation and application of the ten-key adding machines, full keyboard adding machines, and calculator. Prerequisite: None.

BUS-115 Business Law **(3 - 0 - 3)**

A general course designed to acquaint the student with certain fundamentals and principles of business law, including contracts, negotiable instruments, and agencies. The uniform commercial code is considered wherever applicable. Prerequisite: None.

BUS-116 Business Law **(3 - 0 - 3)**

Includes the study of laws pertaining to bailments; insurance; agency; employer and employee relations; business organization; real property; and workers benefits. Prerequisite: BUS 115.

BUS-120 Accounting **(5 - 2 - 6)**

Principles, techniques and tools of accounting, for understanding of the mechanics of accounting. Collecting, summarizing, analyzing, and reporting information about service and mercantile enterprises, to include practical application of the principles learned. Prerequisite: MAT 110.

BUS-121 Accounting **(5 - 2 - 6)**

Partnership and corporation accounting including a study of payrolls, federal and state taxes. Emphasis is placed on the recording, summarizing and interpreting data for management control rather than on bookkeeping skills. Accounting services are shown as they contribute to the recognition and solution of management problems. Prerequisite: BUS 120.

BUS-123 Finance **(5 - 0 - 5)**

Stockmarket transactions and brokerage operations are used as a vehicle in presenting this course. Financing of business units includes individuals, partnerships, corporations, and trusts. Sources and uses of capital are covered. Prerequisite: BUS 101.

BUS-124 Business Finance **(3 - 2 - 4)**

Financing, federal, state, and local government and the ensuing effects upon the economy. Factors affecting supply of funds, monetary and credit policies. Prerequisite: BUS 123.

BUS-219 Credit (5 - 0 - 5)

Principles and practices in the extension of credit; collection procedures; laws pertaining to credit extension and collection are included. Prerequisite: BUS 120.

BUS-225 Cost Accounting (5 - 0 - 5)

Nature and purpose of cost accounting; accounting for direct labor, materials, and factory burden; job cost, and standard cost principles and procedures; selling and distribution cost; budgets, and executive use of cost figures. Prerequisite: BUS 120.

BUS-229 Taxes (3 - 2 - 4)

Application of federal and state taxes to various businesses and business conditions. A study of the following taxes: income, payroll, intangible, capital gain, sales and use, excise, and inheritance. Prerequisite: BUS 121.

BUS-233 Personnel Management and Supervision (5 - 0 - 5)

This course presents the fundamental principles and successful practices in the organization and supervision of employees. A study of the critically important and practical concepts of modern day supervision is presented. Results of modern social-psychological research and case studies are employed to demonstrate and emphasize leadership and motivation in the job situation. Prerequisite: PSY 206.

BUS-235—Business Organization & Management (3 - 2 - 4)

Principles of business organization, administration and management covering management theory including planning, staffing, controlling, coordinating, directing, financing, and budgeting. An over view of developing and engineering the product, methods analysis and control, principles and administration of industrial relations and financing controls as interrelated functions of management are stressed. Prerequisite: BUS 101.

BUS-239 Introduction to Marketing (5 - 0 - 5)

A general survey of the field of marketing, with a detailed study of the function, policies, and institutions involved in the marketing process. Prerequisite: None.

BUS-247—Insurance (5 - 0 - 5)

A presentation of the basic principles of risk insurance and their application. A survey of the various types of insurance is included. Prerequisite: BUS 116.

BUS-270 Methods for Managerial Decisions (3 - 2 - 4)

This course is designed to explain useful techniques, which have been developed to improve decision making in management. Value Analysis; Payoff Tables and Decision Trees; Critical Path Analysis — PERT; and Operations Research are introduced. Inter-relationships and coordination at all levels of management are emphasized. Prerequisite: BUS 101.

CHM-111—General Chemistry (4 - 3 - 5)

This course involves a study of the physical and chemical properties of substances, chemical changes, elements, compounds, gases, chemical combinations, weights and measurements. A study is made of carbohydrates, electro-chemistry, electrolytes and electrolysis in their application of chemistry to industry. Corequisite: MAT 100.

DFT-101 Drafting (0 - 6 - 2)

Use of instruments, geometric constructions, lettering, theory of projection, basic two and three view drawings, basic pictorial drawings, Reproduction process. Prerequisite: None.

DFT-102 Drafting (0 - 6 - 2)

Auxiliary views, sections, dimensions, shop notes, details, basic developments, fasteners, simple assemblies. Prerequisite: DFT 101.

DFT-103 Drafting (0 - 6 - 2)

Complex assemblies, oblique, isometric and perspective drawings, exploded assemblies. Prerequisite: DFT 102.

DFT-201 Design Drafting (2 - 6 - 4)

Structural steel layout and detailing, application of structural shapes, fasteners, weldments and symbols, fluid-distribution system layout and selection of pipe fittings. Piping and wiring diagrams. Charts and graphs. Use of catalog and manuals. Prerequisite: DFT 103.

DFT-204 Descriptive Geometric Design (2 - 6 - 4)

Points, edges, lines, planes, curved lines, curved surfaces, irregular surfaces, intersections, developments, auxiliary projections, revolutions, vectors, and practical design applications. Prerequisite: DFT 102.

DFT-205 Design Drafting (2 - 6 - 4)

Design layout and details of belt and pulley drives, chain and sprocket drives, gear tooth profiles, gear train drives and details, cam layout and displacement diagrams. Prerequisite: DFT 103.

DFT-206 Design Drafting (2 - 6 - 4)

Research to solve a problem in design by consulting various manuals, periodicals, and through laboratory experiments. Preliminary design sketches, layout drawings, detail drawings, assembly and sub-assembly drawings, patent drawings and specifications are introduced. Prerequisite: DFT 205.

DFT-211 Mechanisms and Kinematics Design (2 - 6 - 4)

Alternate position displacement drawing, kinematic displacement, centros, velocities, accelerations, advanced cam layout and applications, displacements, timing and motion diagrams. Prerequisites: DFT 204, DFT 205.

DFT-212 Jig and Fixture Design (2 - 6 - 4)

Industrial standards, principles, practices and tools of jig and fixture design. Individual project and design work to acquaint students with the types of jigs and fixtures and their design. Prerequisite: DFT 211.

ECO-102 Economics (3 - 0 - 3)

The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large. Prerequisite: None.

ECO-104 Economics (3 - 0 - 3)

Greater depth in principles of economics including a penetration into the composition and pricing of national output, distribution of income, international trade and finance, and current economic problems. Prerequisite: ECO 102.

ECO-106 Economics **(3 - 0 - 3)**

Current labor problems and theories; the labor market; the development of labor unions; wage theories and the development of effective labor and wage policies. Prerequisite: ECO 104.

EDP-100 Introduction to Data Processing **(3 - 2 - 4)**

Fundamental concepts and operational principles of data processing systems, along with an introduction to computer programming, are presented for non-data processing majors. The emphasis is on business applications for students from the School of Business Education and on mathematical and technical applications for students from the School of Engineering Technology. Prerequisite: None.

EDP-101 Functional Wiring Principles **(2 - 3 - 3)**

Basic principles of control panel wiring and operation of punched card equipment are emphasized in this course. Laboratory projects based on business applications give key punch, sorter, accounting machine, reproducer, and collator experience to the student. Prerequisite: None.

EDP-102 Introduction to Computer Technology **(2 - 3 - 3)**

Fundamental concepts of data processing and systems analysis including computers, data processing systems, input/output devices, and flowcharting are presented. Machine language is introduced by using the 1620 computer to perform some basic computations. The programs emphasize programming techniques including branches, loops, and address modification. Corequisite: EDP 101.

EDP-104 Business Programming I (SPS) **(2 - 3 - 3)**

The Symbolic Programming Systems (SPS) is the first assembler level language in which the students write programs. Various business applications, including a major payroll project, are flowcharted, programmed, processed on the 1620 computer, and debugged by the student. Prerequisite: EDP 102.

EDP-105 Introduction to Scientific Programming (Fortran) **(2 - 3 - 3)**

Formula Translation (FORTRAN) programming stresses the solution of practical problems of a mathematical nature from business and industry. The course includes programming in basic FORTRAN II, compiled and run on the 1620 computer. Prerequisite: EDP 102.

EDP-107 Introduction to System/360 (DOS) **(3 - 2 - 4)**

This course provides specific information about the System/360 computer. The course shows how it computes, how it is programmed, and what makes up such a computer system. Disk operating system is also introduced in this course. Prerequisite: EDP 102.

EDP-108 Business Programming II (BAL) **(3 - 2 - 4)**

The Basic Assembler Language (BAL) programming course includes details for writing programs to function under the Disk Operating System (DOS) of System/360. Specific information pertaining to DOS is presented. Programs are tested on the S/360-30 computer. Prerequisite: EDP 107.

EDP-110 Business Programming III **(3 - 2 - 4)**

The Common Business Oriented Language (COBOL) is presented in detail. A variety of business and commercial applications are programmed and then tested on the System 360-30 computer as time is available. Prerequisites: EDP 104, EDP 107.

EDP-111 Systems and Procedures (COBOL) **(2 - 3 - 3)**

This course covers studies of typical systems and procedures now being used in commercial and industrial computer installations. The student is given information on feasibility studies, and organization of data for computer application. Major applications are followed up with programming projects performed by the student. Corequisite: EDP 110.

EDP-201 Business Programming IV (RPG) **(2 - 3 - 3)**

Report Program Generator (RPG) coding includes preparation of the spacing chart, file description, file extension, input, calculation, and output specifications. Business application programs are written to utilize the multi-function card machine. Programs are tested on the System 360-20 computer as time is available. Prerequisite: EDP 104.

EDP-202 Systems and Procedures (RPG) **(2 - 3 - 3)**

This course gives the student additional explanation on systems and procedures as they may relate to the report program generator coding system on the System 360 model 20 computer. Corequisite: EDP 201.

EDP-205 Scientific Programming II (FORTRAN IV) **(3 - 2 - 4)**

FORTRAN IV is introduced as an extension of the FORTRAN II course. Prerequisites: EDP 105, MAT 104, MAT 214.

EDP-206 Systems and Procedures (FORTRAN IV) **(2 - 3 - 3)**

Emphasis is on the solution of practical problems of a mathematical nature from business and industry. Corequisite: EDP 205.

EDP-210 Business Programming V (Adv. COBOL) **(2 - 3 - 3)**

This course is an extension of basic COBOL. It allows needed time for understanding and writing more sophisticated programs under OS, DOS, and TOS on the system/360. Prerequisites: EDP 110, EDP 111.

EDP-211 Systems and Procedures (Adv. COBOL) **(2 - 3 - 3)**

Selected program projects are carefully explained from a system viewpoint. Computer programs are then written in COBOL, tested, and documented. Corequisite: EDP 210.

EDP-213 Business Programming VI (PL-1) **(3 - 2 - 4)**

An overview of Programming Language One is presented to the student. Programming projects are assigned. Prerequisites: EDP 105, EDP 110.

EDP-215 Business Programming VII (System/3 and RPG II) **(3 - 2 - 4)**

System/3 introduces a new concept to the small computer field using a 90 column card coded with binary punching. Because of its wide use in smaller installations, this course is offered to introduce students to the System/3 computer and the RPG II language used by it. Prerequisite: EDP 201.

ELC-205 Applied Electricity **(2 - 4 - 4)**

Electrical code, interpretation of nameplate data, motor characteristics and selection, motor controls and protection devices, single phase and three-phase current applications, wire size calculations and Y and Delta connections. Prerequisite: PHY 103.

ELN-101 Fundamentals of D-C (4 - 6 - 6)

Principles of undirectional electricity including: basic electron physics, units of measure of electrical quantities, Ohm's law, series, parallel, series-parallel resistive networks, Kirchhoff's laws, network theorems, basic measuring instruments, electrostatics, capacitors, R-C time constants, magnetics, inductance, L-R time constants, laboratory experiments provide proof of important concepts developed. Prerequisite: None.

ELN-102 Fundamentals of A-C (4 - 6 - 6)

Principles of bi-directional electricity including: sine wave analysis, resistive, inductive, capacitive networks, phasor relations in complex circuits, non resonant and resonant series and parallel L-C-R circuits, inductive coupling, air and iron core transformer analysis. Important theoretical concepts are substantiated by laboratory experiments. Prerequisite: ELN 101.

ELN-105 Vacuum Tubes, Theory and Application (4 - 6 - 6)

An introductory study of the vacuum tube as an active circuit element with both graphical and linear analysis of the device and circuits. A basic examination of the linear amplifier with some applications in feedback and oscillators. Prerequisite: ELN 102.

ELN-205 Introduction to Solid State Devices (4 - 6 - 6)

An introduction of the statistical approach to solid state devices including the simple PN junction and the bipolar transistor.

Basic approach to linear approximations and graphical analysis. Hybrid parameters as an aid to circuit analysis. Introduction to thermal effects and device limits. Prerequisite: ELN 102.

ELN-206 Network Analysis (3 - 2 - 4)

A fundamental approach to reactive effects in linear amplifier design. All frequency dependent attenuation and phase shifting in linear amplifier design is grouped for more general evaluation of these effects. RC and LR components are reevaluated in terms of low-pass and high-pass filters. LC filters are considered especially in pole and zero plots.

Compensated attenuators, various bridge circuits, distributed capacitances in coils, and the non-ideal aspects of circuit elements are treated from the standpoint of equivalent circuits.

Feedback is investigated in its basic aspects. Feedback is applied to the linear amplifier to compensate for the non-ideal aspects such as frequency dependent gain and phasing. Regenerative feedback is also studied in the form of non-resonant and resonant linear oscillator circuits. Prerequisites: ELN 105, ELN 205.

ELN-210 Semiconductor Circuit Analysis (3 - 6 - 5)

An advanced study in bipolar transistors including a thorough investigation of biasing and feedback. Circuit design for thermal and parameter stability.

Basis design with unipolar transistors and negative resistance devices. Introduction to unijunction transistors and thyristors. Prerequisite: ELN 205.

ELN-214 Wave Shaping and Pulse Circuits I **(4 - 4 - 6)**

A logical extension of the principles of the linear amplifier into the switching region. A more rigorous study of feed back is undertaken as a technique for switching. Further study is made of thermal effects, especially the analysis of thermal limitations of certain specific designs. Prerequisite: ELN 210.

ELN-215 Wave Shaping and Pulse Circuits II **(4 - 4 - 6)**

Application is made of RC and RL circuits and transmission lines to wave shaping. Consideration is given to the various gates which have general application in electronics. The saturating transformer is considered for application in magnetic amplifiers, for inverters, and for commutation on DC control circuits. Prerequisite: ELN 214.

ELN-216 Circuits and Fields **(3 - 2 - 4)**

This course is a continuation of ELN 206. A more advanced treatment of wave filters is undertaken and the pole zero aspects are applied more generally to transmission lines. Transmission lines are approached in general but in rigorous terms to provide an understanding of delay and temporal limitations of information handling as well as standing wave ratios. A short introduction to the crank diagram and the Smith chart is made. Distributed and artificial lines are considered as circuit elements in pulse formation. Prerequisite: ELN 206.

ELN-221 Electronic Circuit Design **(1 - 6 - 4)**

A research project for the advanced student to provide a realistic and creative application of his fundamental electronic knowledge to a demonstrateable system of his own design. A further objective in cooperation with the English Department is to provide further experience in preparing meaningful technical reports. Prerequisite: ELN 210.

ELN-226 Microelectronics **(3 - 2 - 4)**

A study of integrated circuits as an evolution from the discrete component to the basic circuit as a fundamental systems structural unit. Fabrication techniques are considered particularly in thick and thin films, resistor and capacitor fabrication, the relative chip cost of active and passive components. A serious study is made of design requirements using the firm understanding of discrete components to enhance the understanding and simplify the approach to microcircuit design. Prerequisite: ELN 216.

ELN-233 Instrumentation I **(3 - 2 - 4)**

A study of basic indicating devices and transducers in ammeters, voltmeters, and ohmmeters. Investigation of basic electrical standards and definitions with emphasis on precision and accuracy. The fundamentals of bridges and potentiometric circuits with attention given to transfer methods and basic definitions of average, rms, and peak reading instrumentation. Prerequisite: ELN 102.

ELN-234 Instrumentation II **(3 - 2 - 4)**

A continuation of Instrumentation I with more emphasis on electronic instrumentation. A review of distortion meters, Q meters, and the more elaborate bridges. A rigorous treatment of the non-sinusoidal periodic waveforms using the Fourier series as an aid in determining average and rms values of these waveforms. Prerequisites: ELN 233, ELN 102, ELN 105, ELN 205.

ELN-235 Industrial Instrumentation (3 - 2 - 4)

An advanced investigation into electronic measuring equipment. The application of electronics to both analog and digital control systems which might be applied in any of the physical sciences. A study of transducers, recorders, sensors. The Industrial applications of telementry. A study of some basic industrial systems. Prerequisite: ELN 234.

ENG-100 Reading and Comprehension (3 - 2 - 4)

A sincere effort to encourage the student's development of reading comprehension and reading rate. Emphasizing the grasp of basic ideas rather than words. To have a storehouse of workable techniques which the student may use in reading assignments. Thus, helping him to identify, interpret, and evaluate ideas. With purposeful practice and adequate motivation the students achievement will improve.

ENG-101 Grammar (3 - 0 - 3)

Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life. Prerequisite: None.

ENG-102 Composition (3 - 0 - 3)

Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph, and whole composition. Prerequisite: ENG 101.

ENG-103 Report Writing (3 - 0 - 3)

The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the prepartion of a full-length report is required of each student. This report is based on material in his chosen curriculum. Prerequisite: ENG 102.

ENG-204 Oral Communication (3 - 0 - 3)

A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, diction, voice, and the application of particular techniques to correct speaking habits and to produce effective oral presentation. Particular attention is given to conducting meetings, conferences, and interviews. Prerequisite: ENG 101.

ENG-206 Business Communication (3 - 0 - 3)

Develops skills in techniques in writing business communications. Emphasis is placed on writing action—sales letters and prospectuses, business reports, summaries of business conferences, letters involving credit, collections, adjustments, complaints, orders, acknowledgements, remittances, and inquiry. Prerequisite: ENG 102.

ISC-102 Industrial Safety (3 - 0 - 3)

Problems of accidents and fire in industry. Management and supervisory responsibility for fire and accident prevention. Additional topics cover accident reports and the supervisor; good housekeeping and fire prevention; machine guarding and personnel protective equipment; state industrial accident code and fire regulations; the first aid department and the line of supervisory responsibility; job instruction and safety instruction; company rules and enforcement; use of safety committees; insurance carrier and the Insurance Rating Bureau; and advertising and promoting a good safety and fire prevention program. Prerequisite: None.

ISC-201 Industrial Management **(3 - 0 - 3)**

The basic managerial decisions, organizational structure including plant location, building requirements, and internal factory organization; problems of factory operation and control, planning, scheduling, routing factory production, stores control, labor control, purchasing, cost control. Plant problems are utilized as lab experiments. Prerequisite: None.

ISC-202 Quality Control **(3 - 2 - 4)**

Principles and techniques of quality control and cost saving. Organization and procedure for efficient quality control. Functions, responsibilities, structure, costs, reports, records, personnel and vendor-customer relationships in quality control. Sampling inspections, process control and tests for significance. Prerequisite: None.

ISC-203 Time and Motion Study **(3 - 2 - 4)**

Principles of motion economy, tools for motion study, time study methods and practice; standard data and formula construction; use of methods-time measurements as a substitute for time studies. Prerequisite: None.

ISC-204 Value Analysis **(3 - 0 - 3)**

The modern concept in the control of manufacturing production. This course will provide the students an opportunity to study a production system with the specific purpose of identifying unnecessary costs. The objective of the concepts and techniques of value analysis is to make possible a degree of effectiveness in **identifying** and **removing** unnecessary cost by the use of sound decisions through a common sense approach. Prerequisite: None.

ISC-209 Plant Layout **(3 - 2 - 4)**

A practical study of factory planning with emphasis on the most efficient arrangements of work areas to achieve lower manufacturing costs. Layouts for small and medium-sized plants, layout fundamentals, selection of production equipment and materials handling equipment. Effective management of men, money and material in a manufacturing operation. Prerequisites: Consent of Advisor.

ISC-211 Work Measurement (Pre-Determined Time) **(3 - 2 - 4)**

Principles of work simplification including administration of job methods improvement, motion study fundamentals and time study techniques. Use of flow and process charts; multiple activity charts, operation charts, flow diagrams and methods evaluation. Prerequisite: ISC 203.

ISC-220 Management Problems (Wage and Salary Administration) **(3 - 0 - 3)**

A study of the basic requirements of a sound wage and salary program. This study includes the techniques of job analysis and job evaluation, commonly used methods of employee rating, and the various wage incentive systems currently being used. Prerequisite: BUS 233.

ISC-251 Labor Problems and Labor Law **(3 - 2 - 4)**

A study of the current problems of industrial societies. Labor requirements for new plants and expanding industries. Training problems in industry and laws that regulate these programs. A study of state and federal laws that regulate various classes of labor. An overview of reports that are made to government agencies, and services rendered to industry from various government agencies. Prerequisite: ECO 104.

MAT-100 Basic Mathematics **(5 - 0 - 5)**

Introduction to mathematics including operations with numbers, fractions, per cent, dimensional analysis, signed numbers, elementary algebra, linear equations, basic plane and solid geometry with emphasis on applications. Prerequisite, entrance requirements.

MAT-101 Algebra and Trigonometry I **(5 - 0 - 5)**

Number systems of various bases are introduced. Fundamental algebra operations, the rectangular coordinate system, as well as fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed. Prerequisite: MAT 100.

MAT-102 Algebra and Trigonometry II **(5 - 0 - 5)**

A continuation of MAT 101. Advanced algebraic and trigonometric topics include quadratics, logarithms, determinants, matrices, progressions, the binominal expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions. Prerequisite: MAT 101.

MAT-103 Analytical Geometry and Calculus I **(5 - 0 - 5)**

The fundamental concepts of analytical geometry, differential and integral calculus are introduced. Topics included are graphing techniques, geometric and algebraic interpretation of the derivative, differentials, rate of change, the integral and basic integration techniques. Applications of these concepts to practical situations are stressed. Prerequisite: MAT 102.

MAT-104 Mathematics of Finance **(5 - 0 - 5)**

The usual business mathematics review of elementary mathematics is omitted because of the prerequisite. The course consists of applied business mathematics with emphasis on the topics which can be implemented on a computer. The course includes interest, present value, discount, compound interest, annuities, extinction of debts, and depreciation. Prerequisite: MAT 101.

MAT-110 Business Mathematics I **(5 - 0 - 5)**

This course stresses the fundamental operations and their application to business problems. Topics covered include payrolls, price marking, interest and discount, commission, taxes, and pertinent uses of mathematics in the field of business. Prerequisite: None.

MAT-111 Business Mathematics II **(3 - 0 - 3)**

This course is a continuation of MAT 110 with further study into the topics of payrolls, price marketing, interest, and discount, commission, taxes, and pertinent uses of mathematics in the field of business. Prerequisite: MAT 110.

MAT-112 Mathematics of Business Finance **(3 - 2 - 4)**

The course consists of practical application of business financial transactions involving analysis of statements, interest, present value, yield, discount, compound interest, annuities, extinction of debt and depreciation. Use of modern calculating equipment will be employed. Prerequisites: MAT 111 and BUS 110.

MAT-114 Basic Descriptive Statistics **(3 - 2 - 4)**

A course in descriptive statistics with emphasis on classification of variables, methods of collecting and presenting data, measures of central tendencies, and types of variables and an introduction to frequency distribution. Prerequisite: MAT 111.

MAT-121 Numbering Systems and Boolean Algebra **(3 - 0 - 3)**

It is a study of various numbering systems with emphasis on the binary, octal and hexadecimal as related to one another, the decimal system, and computers; conversions from one system to another; arithmetic operations in non-decimal systems; elementary logic; and Boolean Algebra. Prerequisite: None.

MAT-201 Calculus II **(5 - 0 - 5)**

A continuation of MAT 103. More advanced concepts of differentiation and integration are considered. Included are derivatives of the trigonometric functions, exponential and logarithmic differentiation and intergration, advanced integration techniques, polar equations, parametric equations. Prerequisite: MAT 103.

MAT-214 Statistics I **(5 - 0 - 5)**

This is an introduction to statistics with emphasis on data analysis including frequency distributions, measures of location and variation; and probability. Practical problems support the theory. Prerequisite: MAT 101.

MEC-101 Machine Processes **(0 - 6 - 2)**

An introductory course designed to acquaint the student with basic hand tools, safety procedures and machine processes of our modern industry. It will include a study of measuring instruments, characteristics of metals and cutting tools. The student will become familiar with the lathe family of machine tools by performing selected operations such as turning, facing, threading, drilling, boring, and reaming. Prerequisite: None.

MEC-102 Machine Processes **(0 - 6 - 2)**

Advanced operations on lathe, drilling, boring and reaming machines. Milling machine theory and practice. Thorough study of the types of milling machines, cutters, jig and fixture devices, and the accessories used in a modern industrial plant. Safety in the operational shop is stressed. Prerequisite: MEC 101.

MEC-105 Statics **(5 - 0 - 5)**

Concepts and basic principles of statics. Parallel concurrent, and noncurrent force systems in coplanar and noncoplanar situations. Concepts of friction. Prerequisites: MAT 102, PHY 102.

MEC-106 Applied Mechanics **(3 - 0 - 3)**

Concepts and principles of statics and dynamics. Parallel concurrent and nonconcurrent force systems in coplanar and noncoplanar situations. Concepts of centroids and center of gravity, moments of inertia, fundamentals of kinetics, and kinematics of velocity and motion. Prerequisites: MAT 102, PHY 101.

MEC-111 Manufacturing Processes **(3 - 3 - 4)**

A survey of manufacturing processes, machines, and materials with regard to their capabilities, capacities, tolerances, finishes, etc. Product design, materials utilized, engineering nomenclature, and common terminology will be discussed. Laboratory to include field trips to various manufacturing industries, demonstration of machine operations, and experience in operating machines. Prerequisite: None.

MEC-112 Manufacturing Processes **(3 - 3 - 4)**

Process planning of operation sequences for efficient production, tool planning, and estimating. An introduction to characteristics of engineering materials. Prerequisite: MEC 111.

MEC-205 Strength of Materials (3 - 2 - 4)

Study of principles and analyze stresses which occur within machine and structure elements subjected to various types of loads such as static, impact, varying and dynamic. Analyses of these stresses are made as applied to thin-walled cylinders and spheres, riveted and welded joints, beams, columns and machine components. Prerequisites: PHY 106, MAT 102.

MEC-206 Dynamics (3 - 0 - 3)

Study of motion as it affects mechanical components. Position, velocity, acceleration, and equations of motion for bodies. Function and design of mechanisms, cams, etc. Prerequisite: MEC 105.

MEC-208 Machine Design (3 - 3 - 4)

A survey course with the selection of components in mechanical design, such as power trains, gearing, bearings, shafts, keys, springs, belts, couplings, clutches, brakes, etc., through the use of manufacturers catalogs, standards, handbooks, etc. Prerequisite: MEC 205.

MEC-209 Machine Design (3 - 3 - 4)

Study of factors affecting the design of machine elements. Empirical and theoretical equations, practical considerations, and procedures of designing are included. Student given practice in applying knowledge of strength and properties of materials, manufacturing processes, economics of production, safety, and elements of good design through problem assignments. Prerequisite: MEC 208.

MEC-210 Physical Metallurgy (3 - 3 - 4)

Introductory course in metallurgy, a basic study of the properties of metals and alloys. Analysis of the structure of metals and alloys. Atomic structure, and its effect on physical properties. Solid (crystalline) structures, methods, methods of designating crystal planes; liquid and vapor phases; phase diagrams; and alloy systems. Prerequisite: PHY 101.

MEC-212 Practical Automation (3 - 2 - 4)

A comprehensive study of automation as it is interpreted and practiced by American industry of today. The fundamentals of automation and its effects in industrial productivity, labor and demand, equipment and processes. Students will solve problems encountered with installing an automated system. Prerequisite: None.

MEC-214 Tool Engineering (3 - 0 - 3)

An introduction to the problems of tool engineering with emphasis on planning the processes of production, designing and developing the necessary tools, and utilizing available manufacturing facilities; practical analysis and comparison of the use and costs of tools, jigs and fixtures, dies, molds, and gauges as they are utilized in our modern day manufacturing and production methods. Prerequisites: DFT 102, MEC 111.

MEC-220 Power Systems (3 - 0 - 3)

Survey of energy conversion systems such as the internal combustion engine, power plant, gas turbine, and refrigerator. Basic thermodynamic principles and laws introduced. Prerequisite: PHY 102.

MEC-235 Hydraulics and Pneumatics (3 - 3 - 4)

The basic theories of hydraulic and pneumatic systems. Combinations of systems in various circuits. Basic designs and functions of circuits and motors, controls, electrohydraulic servomechanisms, plumbing, filtration, accumulators and reservoirs. Prerequisite: PHY 102.

PHY-101 Physics: Properties of Matter **(3 - 2 - 4)**

A fundamental course covering basic principles of physics including solids and their characteristics, liquids at rest and in motion, gas laws and applications. Units of measurements and their applications are a vital part of this course. Laboratory experiments and specialized problems dealing with these topics are a part of this course. Prerequisite: MAT 100.

PHY-102 Physics: Mechanics **(3 - 2 - 4)**

Major areas covered in this course are force, motion, work, energy and power. Instruction includes such topics as vectors and graphic solutions, basic machines, friction and torque. Prerequisites: PHY 101, MAT 101.

PHY-103 Physics: Electricity **(3 - 2 - 4)**

Basic theories of A.C. and D.C. including the electron theory and production of electricity by chemical action, friction, magnetism and induction. Industrial applications involving the use of voltage, amperage, resistance, horsepower and wattage are major parts of the course. Prerequisites: PHY 101, MAT 102.

PHY-104 Physics: Light and Sound **(3 - 2 - 4)**

A survey of the concepts involving wave motion leads to a study of sound, its generation transmission and detection. The principles of wave motion also serves as an introduction to a study of light, illumination and the principle involved in optical instruments. Application is stressed throughout. Prerequisites: MAT 101, PHY 102.

PHY-201 Modern Physics **(3 - 2 - 4)**

An introduction to the important developments in atomic and nuclear physics since the beginning of the present century. The investigation of the photoelectric effect, general relativity, quantum mechanics, and wave mechanics as applied to the statistical treatment of semiconductive crystals. A study of the effective sizes of the electron and the various elemental nuclei. A survey of nuclear radiation effects, radiation counters and detectors, cheronkov radiation and photomultiplication as these affect modern industrial instrumentations. Prerequisite: MAT 103.

PSY-206 Applied Psychology **(3 - 0 - 3)**

A study of the principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community. Prerequisite: None.

SOC-201 Social Science **(3 - 0 - 3)**

An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology. Prerequisite: None.

AHR-1121 Fundamentals of Refrigeration: Domestic **(3 - 11 - 7)**

Terminology, laws of refrigeration, absolute pressure, and absolute temperature, energy conversion units; specific heat, laten heat, and sensible heat; measurement of heat in quantity and intensity; ton of refrigeration, pressure temperature relationships; transfer of heat by conduction, convection, and radiation; elementary refrigeration, refrigeration cycle and domestic refrigeration circuits and controls. Tools, materials, and methods applicable to refrigeration; bending, and joining tubing. Safety practices will be stressed. Emphasis will be placed on domestic equipment because of its basic nature. Prerequisite: None.

AHR-1122 Fundamentals of Refrigeration: Commercial **(3 - 12 - 7)**

Commercial refrigeration installation and servicing of display cabinets, walk in coolers and freezer units and mobile refrigeration systems are studied. The use of catalogs are used to calculate heat loads, sizing, and matching system components and a study of circuits and controls, refrigerants, oils, and methods are made. The American Standard Safety Code for refrigeration is studied and its principles practiced. Prerequisite: AHR 1121.

AHR-1123 Principles of Air Conditioning **(3 - 10 - 7)**

Work includes the selection of various heating, cooling, and ventilating systems, investigation and control of factors affecting air cleaning, movement, temperature, and humidity. Use is made of the psychrometric chart and sling pshchrometer in determining needs to produce optimum temperature and humidity control. Commercial air conditioning equipment is assembled and tested. Heating and coding loads are estimated and duct pressures are studied. Circuit and controls both electric and pneumatic are applied to heating and cooling. Practical sizing and balancing of duct work is performed as needed. Prerequisite: AHR 1122.

AHR-1124 Principles of Heating: Fuels and Burners **(3 - 6 - 5)**

Fuels and burners used in supplying heat for various types of heating systems — coal, oil, natural gas, manufactured gas, liquified petroleum gas, and electricity. Experiments in equipment selection, installation, adjustments, and servicing will be conducted. Warm air systems, heat emitter, electric heating, forced hot water and steam heating systems, including selection and sizing of equipment — registers, grills, furnaces, boilers, radiators, baseboards, piping, and ducts. Heating layout and specifications for an existing structure or one in blueprint stage will be prepared. Prerequisite: AHR 1123.

AHR-1126 All Year Comfort Systems and A.C. Servicing **(3 - 6 - 5)**

Emphasis is placed on the installation, maintenance, and servicing of equipment used in the cleaning, changing, humidification, dehumidification, temperature control, and distribution of air in conditioned spaces. Installation of various ducts and lines needed to connect various components is made. Shop work involves circuit and controls, testing, and adjusting of air conditioning and refrigeration equipment, and locating and correction of equipment failure. Prerequisite: AHR 1124.

AHR-1127 Duct Construction and Maintenance **(3 - 6 - 5)**

Study of various duct materials including sheet steel, aluminum, fiber glass, and plastic. Safety, sheet metal hand tools, cutting and shaping machines, fasteners, and fabrication practices, layout methods, and development of duct systems. The student will study and service various duct systems and perform repairs including ducts made of fiber glass. A study is made of duct fittings, dampers and regulators, diffusers, heater and air washers, fans, insulation and ventilating hoods. Prerequisite: DFT 1116, AHR 1123. Corequisite: AHR 1126.

AUT-1101 Internal Combustion Engine **(3 - 12 - 7)**

Development of a thorough knowledge and ability in using, maintaining, and storing the various hand tools and measuring devices needed in engine repair work. Study of the construction and operation of components of internal combustion engines. Testing of engine performance; servicing and maintenance of pistons, valves, cams and camshafts, fuel and exhaust systems, cooling systems; proper lubrication; and methods of testing, diagnosing and repairing. Prerequisite: None.

AUT-1102 Engine Electrical and Fuel Systems **(5 - 12 - 9)**

A thorough study of the electrical and fuel systems of the automobile. Battery cranking mechanism, generator, ignition, accessories and wiring; fuel pumps, carburetors, and fuel injectors. Characteristics of fuels, types of fuel systems, special tools, and testing equipment for the fuel and electrical system. Prerequisite: AUT 1101.

AUT-1121 Braking Systems **(3 - 3 - 4)**

A complete study of various braking systems employed on automobiles and light weight trucks. Emphasis is placed on how they operate, proper adjustment, and repair. Prerequisite: PHY 1102.

AUT-1123 Automotive Chassis and Suspension Systems **(3 - 9 - 6)**

Principles and functions of the components of automotive chassis. Practical job instruction in adjusting and repairing of suspension, and steering systems. Units to be studied will be shock absorbers, springs, steering systems, steering linkage, and front end and alignment.

AUT-1124 Automotive Power Train Systems **(3 - 9 - 6)**

Principles and functions of automotive power train systems; clutches, transmission gears, torque converters, drive shaft assemblies, rear axles and differentials. Identification of troubles, servicing, and repair. Prerequisites: PHY 1102, AUT 1123.

AUT-1125 Automotive Servicing **(3 - 9 - 6)**

Emphasis is on the shop procedures necessary in determining the nature of trouble developed in the various component systems of the automobile. Troubleshooting of automotive systems, providing a full range of experiences in testing, adjusting, repairing and replacing. Prerequisites: AUT 1123, AUT 1121,

BPR-1101 Blueprint Reading: Power Mechanics **(0 - 3 - 1)**

Interpretation and reading of blueprints. Development of ability to read and interpret blueprints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes. Prerequisite: None.

BPR-1104 Blueprint Reading: Mechanical **(0 - 3 - 1)**

Interpretation and reading the blueprints. Information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes. Prerequisite: None.

BPR-1105 Blueprint Reading: Mechanical **(0 - 3 - 1)**

Further practice of interpreation of blueprints as they are used in industry; study of prints supplied by industry; making plans of operations; introduction to drafting room procedures; sketching as a means of passing on ideas, information and processes. Prerequisite: BPR 1104.

BPR-1106 Blueprint Reading: Mechanical **(0 - 3 - 1)**

Advanced blueprint reading and sketching as related to detail and assembly drawings used in machine shops. The interpretation of drawings of complex parts and mechanisms for features of fabrication, construction and assembly. Prerequisite: BPR 1105.

BPR-1107 Blueprint Reading for Construction Trades **(0 - 3 - 1)**

How to read pictorial and orthographic drawings. Reading elevations, floor plans, symbols, notes, scales, construction types, interior and exterior details. Prerequisite: None.

BPR-1109 Blueprint Reading for Construction Trades **(0 - 3 - 1)**

Advanced reading of design variations, construction materials, practices, planning, specifications and steel structures. Prerequisite: BPR 1107.

BPR-1116 Blueprint Reading for Air Conditioning **(1 - 3 - 2)**

Reading of working prints, exploded drawings, wiring schematics, equipment layouts, shop sketches, building codes, heat systems, standards and symbols. Prerequisite: BPR 1104.

BPR-1117 Blueprint Reading: Welding **(0 - 3 - 1)**

A thorough study of trade drawings in which welding procedures are indicated. Interpretation, use and application of welding symbols, abbreviations, and specifications. Prerequisite: BPR 1104.

BPR-1208 Blueprint Reading: Tool and Die **(2 - 3 - 3)**

A complete and thorough knowledge of tool and die prints will be required. Industrial prints will be used in this course. The difference between production drawings or operation sheets and tools drawing will be presented. Assembly drawings as the piece fits into place will be broken down into each detail print required. Prerequisite: DFT 1207.

BUS-1103 Small Business Operations **(3 - 0 - 3)**

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations. Prerequisite: None.

BUS-1105 Industrial Organizations **(3 - 0 - 3)**

Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost. Prerequisite: None.

CAB-1101 Cabinetmaking I **(5 - 12 - 9)**

This course is designed to introduce the student to hand tools used in a cabinet shop. After several projects with hand tools the student will be placed on each machine. Various types of wood will be used and identification of the various types of wood will be required.

CAB-1102 Cabinetmaking II **(3 - 6 - 5)**

This course will go into the necessary framing for cabinet work. Students will be presented a study of built-in cabinets and pre-constructed cabinet work. Built-in book cases and special work will be presented.

CAB-1103 Cabinetmaking III **(3 - 5 - 4)**

This course will progress into the various woods used in cabinetmaking. Drawers, doors, hardware, and cornice work will be practiced. Methods of finishing and types of finishes will be studied.

CAB-1104 Cabinetmaking IV **(2 - 6 - 4)**

This is a study of the type of materials used on tops and other finished areas. Each student will study built-in appliances such as stoves, ovens, dishwashers, and refrigerators. Finished cornice and standard measurements of all cabinet work will be presented.

CAR-1101 Carpentry I **(2 - 6 - 4)**

This course will be presented as an introduction to the first steps necessary from the finished foundation to the complete framing of a building. Methods of framing entire walls before erection will be presented. Motion saving methods and overall planning of time will be presented. Size of nails and identification of nails will be studied.

CAR-1103 Carpentry II **(2 - 5 - 3)**

In this course the students will study all types of roof construction. Each student will be required to cut and assemble all type of rafters. Students will be required to put on all types of shingles and prepare a roof for “built up construction”. The students will also be required to study the framing square in order to figure the length of rafters and other materials.

CAR-1104 Materials and Finishes **(2 - 3 - 3)**

This course will present an identification and selection of materials. Methods and types of external finishes will be presented. Types of doors, windows, and external siding will be presented. Each student will be required to frame, stop and lock, doors and windows.

CAR-1105 Carpentry III **(3 - 11 - 7)**

This course will present the student with the finish work of carpentry. Types of baseboard, moulding, door facing, and framing and finishing stair cases will be presented. Each student will be subjected to a series of projects under close supervision that will require use of all finishing tools normally used by a carpenter. Clean work and self pride will have an emphasis in this course.

DFT-1126 Pattern Development and Layout **(0 - 3 - 1)**

A study of methods used in layout of sheet steel. Special emphasis is placed on developing pipe and angle layouts by the use of patterns and templates. Prerequisite: None.

DFT-1127 General Drafting-Construction Trades **(2 - 3 - 3)**

A thorough study of trade drawings in which welding procedures are indicated. Interpretation, use and application of welding symbols, abbreviations, and specifications. Prerequisite: BPR 1109.

DFT-1207 General Machine Drafting **(0 - 6 - 2)**

Use of instruments, lettering, scales, geometric constructions, applied geometry, orthographic projections, pictorial sketching, plate cam layout, displacement, timing, and motion diagrams. Prerequisite: None.

ELC-1117 Basic Electricity **(3 - 0 - 3)**

A study of the electrical structure of matter and electron theory, the relationship between voltage, current, and resistance in series, parallel, and series-parallel circuits. An analysis of direct current circuits by Ohm’s Law and Kirchoff’s Law. A study of the sources of direct current voltage potentials. Fundamental concepts of alternating current flow, reactance, impedance, phase angle, power, and resonance. Analysis of alternating current circuits.

ELC-1118 Applied Electricity (1 - 2 - 1)

Provides fundamental concepts in single and polyphase, alternating current circuits, voltages, currents, power measurements, transformers, and motors. Instruction in the use of electrical test instruments in circuit analysis. The basic concepts of AC and DC machines and simple system controls. An introduction to the type control used in small appliances such as: thermostats, timers, or sequencing switches. Prerequisite: ELC 1117.

ELC-1201 Electricity-Industrial

A study of the relationship between voltage, current and resistance in series, parallel and series—parallel circuits. Fundamental concepts of alternating current flow; a study of reactance, impedance, phase angle, power and resonance and alternating current circuit analysis.

ENG-1101 Reading Improvement (2 - 0 - 2)

Designed to improve the student's ability to read rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination, and to train for comprehension in larger units. Prerequisite: None.

ENG-1102 Communication Skills (3 - 0 - 3)

Designed to promote effective communication through correct language usage in speaking and writing. Prerequisite: ENG 1101.

MAT-1101 Fundamentals of Mathematics (5 - 0 - 5)

Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades Practice in depth. Prerequisite: None.

MAT-1103 Geometry (3 - 0 - 3)

Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction, areas and volumes of solids. Geometric principles are applied to shop operations. Prerequisite: MAT 1101.

MAT-1104 Trigonometry (3 - 0 - 3)

Trigonometric ratios; solving problems with right triangles, using tables, and interpolation; solution of oblique triangles using law of sines and law of cosines; graphs of the trigonometric functions; inverse functions, trigonometric equations. All topics are applied to practical problems. Prerequisite: MAT 1103.

MAT-1123 Machinist Mathematics (3 - 0 - 3)

Introduces gear ratio, lead screw and indexing problems with emphasis on application to the machine shop. Practical applications and problems furnish the trainee with experience in geometric propositions and trigonometric relations to shop problems; concludes with an introduction to compound angle problems. Prerequisite: MAT 1104.

MAT-1203 Trigonometry (5 - 0 - 5)

A basic review of mathematics will form a foundation for a study of trigonometry of right triangles, oblique triangles, and dimensional analysis. Applications to typical problems found in the tool and die shop will be presented and solutions will be found by using mathematics. Prerequisite: MAT 1123.

MAT-1204 Compound Angles and Curves **(5 - 0 - 5)**

The application of trigonometry and geometry are presented to solve compound angle problems. This course will use as many practical problems as possible to enable the student to work with typical problems. Prerequisite: MAT 1203.

MEC-1101 Machine Shop Theory and Practice **(3 - 12 - 7)**

An introduction to the machinist trade and the potential it holds for craftsman. Deals primarily with the identification, care and use of basic hand tools and precision measuring instruments. Elementary layout procedures and processes of lathe, drill press, grinding (off-hand) and milling machines will be introduced both in theory and practice. Prerequisite: None.

MEC-1102 Machine Shop Theory and Practice **(3 - 12 - 7)**

Advanced operations in layout tools and procedures, power sawing, drill press, surface grinder, milling machine shaper. The student will be introduced to the basic operations on the cylindrical grinder and will select projects encompassing all the operations, tools and procedures thus far used and those to be stressed throughout the course. Prerequisite: MEC 1101.

MEC-1103 Machine Shop Theory and Practice **(3 - 12 - 7)**

Advanced work in the engine lathe, turning, boring and threading machines, grinders, milling machine and shaper. Introduction to basic indexing and terminology with additional processes on calculating, cutting and measuring of spur, helical, and worm gears and wheels. The trainee will use precision tools and measuring instruments such as vernier height gages, protractors, comparators, etc. Basic exercises will be given on the turret lathe and on the tool and cutter grinder. Prerequisite: MEC 1102.

MEC-1104 Machine Shop Theory and Practice **(5 - 12 - 9)**

Development of class projects using previously learned procedures in planning, blueprint reading, machine operations, final assembly and inspection. Additional processes on the turret lathe, tool and cutter grinder, cylinderical and surface grinder, advanced milling machine operations, etc. Special procedures and operations, processes and equipment, observing safety procedures faithfully and establishing of good work habits and attitudes acceptable to the industry. Prerequisite: MEC 1103.

MEC-1112 Machine Shop Processes

To acquaint the student with the procedures of layout work and the correct use of hand and machine tools. Experiences in the basic fundamentals of drill press and lathe operation; hand grinding of drill bits and lathe tools; set-up work applied to the trade.

MEC-1115 Treatment of Ferrous Metals **(2 - 3 - 3)**

Investigate the properties of ferrous metals and tests to determine their uses. Instructions will include some chemical metallurgy to provide a background for the understanding of the physical changes and causes of these changes in metals. Physical metallurgy of ferrous metals, producing iron and steel, theory of alloys, shaping and forming, heat treatments for steel, surface treatments, alloy of special steel, classification of steels, and cast iron will be topics for study. Prerequisite: None.

MEC-1116 Treatment of Non-Ferrous Metals **(2 - 1 - 2)**

Continuation of the study of physical metallurgy. The non-ferrous metals: bearing metals, (brass, bronze, lead), light metals (aluminum and magnesium), and copper and its alloys are studied. Powder metallurgy, titanium, zirconium, indium and vanadium are included in this course. Prerequisite: MEC 1115.

MEC-1124 Metallurgy

A study of chemical metallurgy to provide a background for understanding the physical changes and causes of these changes in metals. Physical metallurgy for ferrous and non-ferrous metals will be presented. The theory of alloys and classification of metals will be topics for study.

MEC-1201 Machine Processes **(3 - 12 - 7)**

This course is designed to introduce the student to the tools, instruments, machines, and methods used in the tool and die shop. Basic diemaking theory will be presented as it pertains to simple piercing, blanking, and blending dies. Each student will be subjected to a series of projects requiring extreme proficiency. Prerequisite: Machine Shop Graduate or equivalent.

MEC-1202 Machine Processes **(3 - 12 - 7)**

This course is a study of certain individual parts that go into a die assembly. Students will go into detail concerning their making, assembly, functioning and properties necessary for satisfactory service. Continued project work will point out the requirements for precise work. Prerequisite: MEC 1201.

MEC-1203 Metallurgy **(3 - 0 - 3)**

This is a study of a special group of steels used by the tool and die industry. Students are concerned with the selection, machining, and heat treating of these steels. Troubleshooting to find the reason for possible failure of the steel and the remedy required will be an important part of this course. Prerequisite: None.

MEC-1204 Machine Processes **(3 - 12 - 7)**

This course is a continuation of MEC 1202 in which students will make a detailed study of die-block construction, strippers and stock guides, shedders and knockouts, nest gages, and pushers. Project work has advanced to the finish grinding and assembly stage requiring high quality work from the student. Prerequisite: MEC 1202.

MEC-1205 Strength of Materials **(5 - 0 - 5)**

A study of stresses and shears that occur in materials when subjected to tensile, compressive, and/or shearing forces. Stresses in thin walled cylinders, riveted and welded joints, shear and bending moment diagrams, deflection, eccentrically applied loads, torsion, and factors of column design will be emphasized. Prerequisite: MAT 1203.

MEC-1206 Machine Processes **(3 - 12 - 7)**

A study of die stops completes the study of die components as presented in this course. Stock strip utilization and strip layout will be covered. Die sets and purchased parts will be discussed. We will study die assembly, set up practices, punch press operation, and a miscellaneous group of methods necessary to complete this course.

MEC-1207 Special Problems and Molding **(3 - 4 - 5)**

This course will be used to subject the student to special problems within local industries. Numerous field trips will be scheduled to review installation of systems, development of dies, tools, jigs and fixtures, and gaging. Each student will be required to follow one complete system from the design stage through to production. Special procedures of die casting, sand casting, shell molding, injection molding, hydro forming, and others will be presented.

MEC-1209 Hydraulics and Pneumatics **(3 - 0 - 3)**

A basic study of the principles of power hydraulics. Component parts such as reservoirs, strainers, filters, piping and fittings, motors, pumps, and valves will be thoroughly studied. Practical circuits and systems will be covered especially as they are used in the tool and die industry. Prerequisite: None.

MEC-1212 Tool Planning

This course will enable the student to plan the process of production and isolate the areas that must be tooled for production. Cost of tools, die work, jig and fixtures, and gauging will be considered. Students will review available items from vendors and utilize standard bushing charts and other references. Typical tool design procedures will be employed and prints must reflect standard procedures.

PHY-1101 Applied Science **(3 - 2 - 4)**

An introduction to physical principles and their application in industry. Topics in this course include measurement; properties of solids, liquids, and gases; basic electrical principles. Prerequisite: MAT 1101.

PHY-1102 Applied Science **(3 - 2 - 4)**

The second in a series of two courses of applied physical principles. Topics introduced in this course are heat and thermometry, and principles of force, motion, work, energy, and power. Prerequisite: PHY 1101.

PSY-1101 Human Relations **(3 - 0 - 3)**

A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation. Prerequisite: None.

WLD-1101 Basic Welding and Cutting **(1 - 2 - 2)**

Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding and flame cutting. Emphasis on electric arc and gas welding methods applicable to mechanical repair work. Bronze welding and silver soldering may also be covered.

WLD-1112 Mechanical Testing and Inspection **(1 - 3 - 2)**

The standard methods for mechanical testing of welds. The student is introduced to the various types of tests and testing procedures and performs the details of the test which will give adequate information as to the quality of the weld. Types of tests to be covered are: bend, destructive, free-bend, guided-bend, nick-tear, notched-bend, tee-bend, nondestructive, V-notch, Charpy impact, etc. Prerequisites: WLD 1120, WLD 1121.

WLD-1120 Oxyacetylene Welding and Cutting **(3 - 12 - 7)**

Introduction to the history of oxyacetylene welding, the principles of welding and cutting, nomenclature of the equipment, assembly of units. Welding procedures such as practice of puddling and carrying the puddle, running flat beads, butt welding in the flat, vertical and overhead position, brazing, hard and soft soldering. Safety procedures are stressed throughout the program of instruction in the use of tools and equipment. Students perform mechanical testing and testing and inspection to determine quality of the welds. Prerequisite: None.

WLD-1121 ARC Welding **(3 - 12 - 7)**

The operation of AC transformers and DC motor generator arc welding sets. Studies are made of welding heats, polarities, and electrodes for use in joining various metal alloys by the arc welding process. After the student is capable of running beads, butt and fillet welds in all positions are made and tested in order that the student may detect his weaknesses in welding. Safety procedures are emphasized throughout the course in the use of tools and equipment. Prerequisite: None.

WLD-1122 Commercial and Industrial Practices **(3 - 9 - 6)**

Designed to build skills through practices in simulated industrial processes and techniques: sketching and laying out on paper the size and shape description, listing the procedure steps necessary to build the product, and then actually following these directions to build the product. Emphasis is placed on maintenance, repairing worn or broken parts by special welding applications, field welding and nondestructive tests and inspection. Prerequisites: WLD 1120, WLD 1121.

WLD-1123 Inert Gas Welding **(1 - 3 - 2)**

Introduction and practical operations in the use of inert-gas-shield arc welding. A study will be made of the equipment, operation, safety and practice in the various positions. A thorough study of such topics as: principles of operation, shielding gases, filled rods, process variations and applications, manual and automatic welding. Prerequisites: WLD 1120, WLD 1121.

WLD-1124 Pipe Welding **(3 - 12 - 7)**

Designed to provide practice in the welding of pressure piping in the horizontal, vertical, and horizontal fixed position using shielded metal arc welding processes according to Sections VIII and IX of the ASME code. Prerequisite: WLD 1121.

WLD-1125 Certification Practices **(3 - 6 - 5)**

This course involves practice in welding the various materials to meet certification standards. The student uses various tests including the guided bend and the tensile strength tests to check the quality of his work. Emphasis is placed on attaining skill in producing quality welds. Prerequisites: WLD 1120, WLD 1121, WLD 1123, WLD 1124.